

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all previous versions and listings of claims in this application.

Claim Listing:

Claims 1-21: (Cancelled).

22. (Currently Amended). A method for deciding whether a mobile station used by a subscriber is allowed to camp in a cell of a mobile communications system comprising cells, the method comprising:

~~and defining~~ location areas each associated with a respective Location Area Code (LAC) and ~~defining comprising~~ a group of cells so that each cell of the mobile communications system belongs to a location area, wherein within each location area, the mobile station may move without updating its location,

~~the mobile communications system further comprising defining~~ localized service areas each associated with a respective Localized Service Area identification (LSA-ID), wherein the localized service areas may overlap and be discontinuous so that a cell may belong to one or more localized service areas or to none of the localized service areas, and a localized service area may comprise cells belonging to different location areas so that when the mobile station is moving within the localized service area a location update may be triggered because the location area changes, ~~the method comprising:~~

defining some of the location areas to be exclusive location areas each exclusive location area being associated-identified with a respective LAC, an exclusive location area comprising exclusive cells for which an exclusive service condition is defined, so that a location area is either an exclusive location area or a non-exclusive location area;

broadcasting an LAC of a cell and, if the cell belongs to at least one localized service area, broadcasting an LSA-ID of each localized service area to which the cell belongs;

receiving, via the cell, a request for location update which initiates a location update procedure for updating the subscriber's location to a new location area and includes a LAC for the new location area to which the subscriber would like to update;

checking during the location update procedure whether the new location area indicated by the LAC is defined as an exclusive location area; and

if the new location area is an exclusive location area,

using the exclusive service condition of the cell in determining whether or not the subscriber is allowed to camp in the cell,

allowing the mobile station to camp in the cell by accepting the location update if the subscriber is allowed to camp in the cell, and

preventing the mobile station from camping in the cell by rejecting the location update if the subscriber is not allowed to camp in the cell,

if the new location area is not an exclusive location area:

checking whether or not the subscriber has localized service information which comprises at least one localized service area identification (LSA-ID) with information about the subscriber's access rights outside the LSA-IDs;

if the subscriber has the localized service information, using it to determine whether or not the subscriber is allowed to camp in the cell; and

if the subscriber has no localized service information, allowing the subscriber to camp in the cell.

23. (Previously Presented) A method according to claim 22, the method further comprising maintaining information about location areas that are defined as exclusive location areas in a network element configured to reject or accept location updates.

24. (Previously Presented) A method according to claim 23, the method further comprising:

maintaining cell information indicating whether a cell is an exclusive cell; and

using said cell information to define whether the new location area is an exclusive location area.

25. (Previously Presented) A method according to claim 22, the method further comprising:

receiving an indication indicating whether the cell is an exclusive cell during location update; and

deciding on the basis of the indication whether the location area of the cell is an exclusive location area.

26. (Previously Presented) A method according to claim 22, wherein

the exclusive cells are exclusive access cells belonging to one or more localized service areas; and

if the new location area is an exclusive location area, whether or not the subscriber is allowed to camp in the cell is determined by checking whether or not the subscriber has the localized service area information and if the subscriber has the localized service area information comparing the LSA-IDs of the subscriber with the LSA-IDs of the cell and allowing the subscriber to camp in the cell only if there is a match, and if the subscriber does not have the localized service information the subscriber is not allowed to camp in the cell.

27. (Previously Presented) A method according to claim 22, further comprising:

defining location areas so that when an exclusive access cell belongs to a location area, the other cells in that location area are also exclusive cells;

maintaining information about location areas comprising exclusive cells; and

using that information to decide whether the location area of the cell is an exclusive location area.

28. (Previously Presented) A method according to claim 22, further comprising rejecting the location update with the cause "roaming not allowed in this location area".

29. (Previously Presented) A method for deciding whether to trigger a location update by a mobile station used by a subscriber in a mobile communications system comprising cells, and location areas each associated with a respective Location Area Code (LAC) and defining a group of cells so that each cell belongs to a location area, wherein within each location area, the mobile station may move without updating its location, the mobile communications system further comprising localized service areas each associated with a respective Localized Service Area identification (LSA-ID), wherein the localized service areas may overlap and be discontinuous so that a cell may belong to one or more localized service areas or to none of the localized service areas, and a localized service area may comprise cells belonging to different location areas so that when the mobile station is moving within the localized service area a location update may be triggered because the location area changes, the method comprising:

storing each LSA-ID of a subscriber using the mobile station if the subscriber has at least one localized service area;

storing the LAC of a current cell serving the mobile station;

moving from the current cell to a new cell;

receiving in a broadcast of the new cell the LAC of the new cell;

receiving in the broadcast the LSA-ID of each localized service area the new cell belongs to if the new cell belongs to at least to one localized service area;

receiving in the broadcast an indication of exclusive access (EA), indicating that a cell is an exclusive cell that belongs to an exclusive location area if the new cell is an exclusive cell for which an exclusive service condition is defined;

comparing in the mobile station the LAC of the new cell with the stored LAC, and if they are not the same, checking, whether the broadcast of the new cell contained the EA,

if the broadcast contained the EA

comparing the LSA-IDs of the new cell with the subscriber's LSA-IDs and if there is a match, sending a location update request, or

if there is no match or if the subscriber has no LSA-IDs, trying to find a suitable cell in which to camp and if a suitable cell is not found, entering a limited service state in the mobile station,

if the broadcast contained no EA, sending a location update request to the system.

30. (Previously Presented) A system comprising:

mobile stations; and

a network comprising:

exclusive cells and other cells via which a mobile station may be connected to the network,

location areas each identified by a Location Area Code (LAC) and defining a groups of cells so that each cell belongs to a location area within which mobile stations may move without updating their location, wherein at least one of the location areas identified by the LAC is defined to be an exclusive location area comprising at least one exclusive access cell for which an exclusive service condition is defined, and

localized service areas each associated with a respective Localized Service Area identification (LSA-ID), wherein the localized service areas may overlap and be discontinuous so that a cell may belong to several localized service areas or to none of the localized service areas, and a localized service area may comprise cells belonging to different location areas so that when a mobile station is moving within the localized service area a location update may be triggered because the location area changes,

the network being configured to broadcast in each cell the LAC of a cell and, if the cell belongs to at least one localized service area, the LSA-ID of each localized service area the cell belongs to, wherein

each mobile station is configured, in response to receiving a LAC of a new location area in a cell broadcast, to send to the network a location update request which includes the LAC of the new location area and information about the subscriber using the mobile station, and

the network is configured to access information about exclusive location areas and, in response to receiving a location update request of a mobile station, to check whether the location area in the location update request and indicated by LAC is defined as an exclusive location area and if it is, to use the exclusive service condition of the cell to determine whether or not the subscriber is allowed to camp in the cell, and to reject the location update if the subscriber is not allowed to camp in the cell; and if the location area is not an exclusive location area to check whether or not the subscriber has localized service information comprising at least one localized service area identification (LSA-ID) with information about the subscriber's access rights outside the subscriber's LSA-IDs, if the subscriber has the localized service information, to use it to determine whether or not the subscriber is allowed to camp in the cell, and if the subscriber has no localized service information, to allow the subscriber to camp in the cell.

31. (Previously Presented) A system according to claim 30, wherein

the network is configured to further broadcast an indication (EA) that the cell is an exclusive cell when the cell belongs to an exclusive location area, and

the mobile station is configured, in response to receiving both a new LAC and said indication EA, to determine whether the mobile station is allowed to camp in the cell, and if it is allowed, to send a location update request to the network, or if it is not allowed, to try to find a suitable cell in which to camp and if a suitable cell is not found, to enter a limited service state.

32. (Previously Presented) A system according to claim 30, wherein the exclusive cells are exclusive access cells belonging to one or more localized service areas; and

if the new location area is an exclusive location area, the network is further configured to receive information on the localized service area of the cell and to determine whether the subscriber is allowed to camp in the cell by checking whether or not the subscriber has the localized service area information and if the subscriber has the localized service area information,

the network is further configured to compare the LSA-IDs of the cell with the subscriber's LSA-ID and to allow the subscriber to camp in the cell only if there is a match, and if the subscriber does not have the localized service information, the network is further configured to determine that the subscriber is not allowed to camp in the cell.

33. (Previously Presented) A system according to claim 30, wherein the network is configured to broadcast further an indication EA that the cell is an exclusive access cell when the cell is an exclusive access cell, and

the mobile station is configured to store LSA-IDs of the subscriber, if the subscriber has at least one localized service areas, and, in response to receiving a combination of a LAC of the new location area, one or more LSA-IDs and said indication EA, to compare the received LSA-IDs with the subscriber's LSA-IDs stored to the mobile station, and

if there is a match, to send a location update request to the network, or if there is no match, to try to find a suitable cell in which to camp and if a suitable cell is not found, to enter a limited service state.

34. (Previously Presented) A network element for a mobile communications system taking part in location update procedures between the system and a mobile station, said system comprising cells, and location areas each associated with a respective Location Area Code (LAC) and defining a groups of cells so that each cell belongs to a location area, wherein within each location area the mobile station may move without updating its location, which LAC the system is configured to broadcast in a cell broadcast, wherein at least one of the location areas identified by the LAC is defined to be an exclusive location area comprising at least one exclusive access cell for which an exclusive service condition is defined, the system further comprising localized service areas each associated with a respective Localized Service Area identification (LSA-ID), wherein the localized service areas may overlap and be discontinuous

so that a cell may belong to one or more localized service areas or to none of the localized service areas, and a localized service area may comprise cells belonging to different location areas so that when the mobile station is moving within the localized service area a location update may be triggered because the location area changes, the system being further configured to broadcast in the cell broadcast an LSA-ID of each localized service area the cell belongs to, if the cell belongs to at least one localized service area,

wherein the network element comprises a processor configured:

to store or to have access to information about the at least one location area defined to be an exclusive location area,

to have access to subscribers' localized service area information and localized service information on cells, and,

in response to receiving from a mobile station a location update request to a cell belonging to a location area identified by a LAC in the request, to check whether the location area indicated by the LAC is defined as an exclusive location area and if it is, to use the exclusive service condition of the cell to check whether the subscriber is allowed to camp in the cell, and to reject the location update if the subscriber is not allowed to camp in the cell and if the location area is not an exclusive location area to check whether or not the subscriber has localized service information comprising at least one LSA-ID with information about the subscriber's access rights outside the LSA-ID,

if the subscriber has the localized service information, to use it to determine whether or not the subscriber is allowed to camp in the cell, and if the subscriber has no localized service information, to allow the subscriber to camp in the cell.

35. (Previously Presented) A network element according to claim 34, wherein the exclusive cells are exclusive access cells belonging to one or more localized service areas; and

if the new location area is an exclusive location area, the processor is further configured:

to receive information on the localized service area of the cell and to determine whether the subscriber is allowed to camp in the cell by checking whether or not the subscriber has the localized service area information and if the subscriber has the localized service area information,

to compare the LSA-IDs of the cell with the subscriber's LSA-IDs and to allow the subscriber to camp in the cell only if there is a match, and

if the subscriber does not have the localized service information, to determine that the subscriber is not allowed to camp in the cell.

36. (Previously Presented) A network element according to claim 34, wherein the information about location areas defined as exclusive location areas comprises location areas having at least one cell which is in the area of the network element.

37. (Previously Presented) A mobile station for a mobile communications system comprising cells, and location areas each associated with a respective Location Area Code (LAC) and defining a groups of cells so that each cell belongs to a location area, wherein within each location area the mobile station may move without updating its location, the system further comprising localized service areas each associated with a respective Localized Service Area identification (LSA-ID), wherein the localized service areas may overlap and be discontinuous such that a cell may belong to one or more localized service areas or to none of the localized service areas, and a localized service area may comprise cells belonging to different location areas so that when the mobile station is moving within the localized service area a location update may be triggered because the location area changes, the mobile station comprising:

a processor and a memory operatively connected thereto, wherein the memory contains an LSA-ID associated with each localized service area for a subscriber using the mobile station, wherein the processor is configured:

to support localized service area definitions,

to access the LSA-ID in the memory,

to receive broadcast information about a location area of a cell, the information including the LAC of the cell, LSA-IDs of each localized service area the cell belongs to if the cell belongs to at least one localized service area, and an indication of exclusive access (EA) if the cell belongs to a location area defined to be an exclusive location area comprising exclusive cells for which an exclusive service condition is defined, and,

in response to receiving in the broadcast a LAC of a new location area, the LSA-IDs of the cell and the EA, to compare the received LSA-IDs with the subscriber's LSA-IDs, and

if there is a match between the received LSA-IDs and the subscriber's LSA-IDs, to send a location update request to the system, or

if there is no match or if the subscriber has no LSA-IDs, to try to find a suitable cell in which to camp and if a suitable cell is not found, and to enter a limited service state; and,

in response to receiving in the broadcast a LAC of a new location area and LSA-IDs of the cell but no EA, to send a location update request to the system.

38. (Currently Amended) A method for deciding whether a mobile station used by a subscriber is allowed to camp in a cell of a mobile communications system comprising cells, the method comprising:

defining a group of cells so that each cell of the mobile communications system belongs to one location area of a plurality of location areas each location area being identified with a respective LAC, wherein within each location area, the mobile station may move without updating its location;

defining a portion of the plurality of location areas to be exclusive location areas, each of said portion being ~~associated~~ identified with a respective Location Area Code (LAC), each exclusive location area comprising exclusive cells for which an exclusive service condition is defined, wherein, within each exclusive location area, the mobile station may move without updating its location;

broadcasting an LAC of a particular cell and, if the particular cell ~~belongs~~ provides special services only to some subscribers to at least one localized service area (LSA),
broadcasting an localized service area identification (LSA-ID) of each ~~LSA to which the particular service cell belongs~~ provides;

receiving, via the particular cell, a request for location update which initiates a location update procedure for updating the subscriber's location to a new location area and includes a LAC for the new location area to which the subscriber would like to update;

checking during the location update procedure whether the new location area indicated by the LAC is defined as an exclusive location area; and

if the new location area is an exclusive location area:

using the exclusive service condition of the cell in determining whether or not the subscriber is allowed to camp in the cell,

allowing the mobile station to camp in the cell by accepting the location update if the subscriber is allowed to camp in the cell, and

preventing the mobile station from camping in the cell by rejecting the location update if the subscriber is not allowed to camp in the cell; or

if the new location area is not an exclusive location area:

checking whether or not the subscriber has ~~localized service information which comprises at least one LSA-ID with information about the subscriber's access rights outside the LSA-IDs~~; subscribed a specific special service with restricted access right; and

if the subscriber has ~~the localized service information~~ subscribed the specific special service, using ~~the localized service information~~ its restricted access right to determine whether or not the subscriber is allowed to camp in the cell; or

if the subscriber has not subscribed the specific special service ~~localized service~~
~~information~~, allowing the subscriber to camp in the cell,

wherein cells providing the same special service are grouped to form a localized
service area, which is other than the location areas and the exclusive location
areas.